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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,282	03/30/2004	Yasutaka Nakashiba	8008-1052	2273

466 7590 10/14/2010
YOUNG & THOMPSON
209 Madison Street
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Alexandria, VA 22314

EXAMINER

JACKSON JR, JEROME

ART UNIT	PAPER NUMBER
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2815

NOTIFICATION DATE	DELIVERY MODE
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10/14/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

DocketingDept@young-thompson.com

Office Action Summary	Application No. 10/812,282	Applicant(s) NAKASHIBA, YASUTAKA	
	Examiner Jerome Jackson Jr.	Art Unit 2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 August 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23-50 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 23-50 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>5/18/10</u> . | 6) <input type="checkbox"/> Other: _____ |

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 23-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kudo with O, APA and further in view of Compton, all of record.

The new claims do not distinguish over the applied art because the structure of Compton can be considered a parallel circuit of capacitors, including the "varactor" capacitor comprising "only" the tunnel insulating film. The overlying capacitor layers are additional capacitor structure including overlying dielectric and conductive layers in parallel circuit connection with the "varactor" capacitor. The term "only" does not distinguish the claim over the applied art. See figure 11 of Compton where several parallel connected capacitors are shown. Each conductor/dielectric/conductor structure can be considered, or labeled, or function as a single capacitor. The term "only" does not patently distinguish the claims. Moreover, removing the overlying capacitor layers cannot be considered a patentable unobvious design over the disclosure of the applied art as the lower "varactor" capacitor alone would still be a functional and useful "capacitor" structure. The overlying layers add to the total capacitance, however, a structure absent them is not unobvious here, nor are there any unexpected results. See *In re Kuhle* 188 USPQ 7 (CCPA) deciding deletion of a feature in prior art, with elimination of its function, is generally obvious.

Applicant's arguments filed 8/4/10 have been fully considered but they are not persuasive.

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Applicant's argument Compton is not a varactor capacitor is unpersuasive. The depletion layer thickness of Compton depends on the voltage applied to the overlying conductor layer. As with any depletion layer capacitor structure, the capacitance depends on or is a function of the applied voltage. The varactor contribution to the capacitance is not dominant, however, it is still present and is clearly acknowledged by Compton several times in the disclosure.

Applicant's argument the varactor of Compton does not comprise an insulation film thinner than the gate insulation films of the transistors is clearly unpersuasive because the tunnel insulating film of the varactor is 80 angstroms thick and cannot be used as the gate insulating films because any voltage higher than 1 volt will initiate tunneling. The MOSFET devices operate at voltages above 1 volt and must necessarily have thicker insulating films. In fact Compton discloses prior art attempts to employ sub 100 angstrom films for capacitors would generally fail because the processing conditions were not perfected enough to avoid shorts or defects. It is clearly evident from the applied art that everyone in the art recognizes the varactor capacitors should have the thinnest available dielectrics. Hence the thinnest MOSFET structures were previously employed for varactor structures. Compton discloses a superior capacitor structure where previously unusable or unavailable sub 100 angstrom capacitor dielectrics could now be practiced for large area capacitor structures because the new processes can form a sub 100 angstrom dielectric with the required integrity. There is clearly no invention here as Compton discloses varactor capacitor or plain capacitor dielectric thickness below 100 angstroms, and clearly below the thickness of the

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thinnest MOSFET gate insulation films. The varactor insulating film is compared to a similar tunneling insulating film in an EEPROM device, also thinner than the gate insulating films.

Arguments regarding the calculated film thickness of the MOSFETs vs. capacitors is unpersuasive because regardless of the mathematics, the capacitor dielectric of Compton is thinner than the MOSFET dielectric.

Arguments regarding the use of a single insulation layer have been addressed above. Capacitors are structures fundamentally comprised of a dielectric material between two conductors. A varactor structure comprises a depletion region as a dielectric. The size of the depletion region is determined by the voltage applied across the depletion region by the two conductors. Compton discloses a simple varactor structure including a depletion region, a tunneling dielectric and an overlying conductor. Additional overlying conductors and dielectrics can be labeled or considered additional capacitor structures in parallel with the varactor structure.

Finally, these claims are device claims rather than method of using claims. Regardless of the applied voltage, the Compton device still defines varactor structure, and the references taken together suggest varactor capacitors integrated with MOSFETs wherein the varactors have the thinnest dielectric thickness to enable the highest magnitudes of capacitance.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jerome Jackson Jr. whose telephone number is 571-272-1730. The examiner can normally be reached on M-Th.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Parker can be reached on 571-272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jerome Jackson Jr./
Primary Examiner, Art Unit 2815